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Observations of Comets made at the Orwell Park Observatory in the years 1887–88. By John J. Plummer, M.A.

Comet V. 1887 (*Olbers–Brooks.*)

1887.	Greenwich Mean Time.	Comet–Star. Δα.	Comet–Star. Δδ.	No. of Comps.	Comet's App. R.A.	Log ($p \times \Delta$).	Comet's App. Dec.	Log ($p \times \Delta$).	Red. to App. Place.		Comp. Star.
	h m s	m s	′ ″		h m s		° ′ ″		s	″	
Sept. 12	15 31 57	+2 59·38	− 1 12·6	8–8	9 56 4·77	9·6129$_n$	+30 9 51·1	0·8208	+0·08	−7·7	1
Oct. 10	16 31 35	+1 57·67	+ 8 12·0	9–9	12 13 25·80	9·6035$_n$	+25 23 17·2	0·8108	+0·04	−5·3	2
12	16 5 31	−1 4·32	+ 3 6·4	8–8	12 22 43·50	9·5939$_n$	+24 47 3·3	0·8304	+0·04	−4·8	3
13	16 32 1	+2 2·32	+ 4 2·7	9–9	12 27 27·38	9·6000$_n$	+24 27 42·4	0·8146	+0·05	−4·9	4
17	16 55 5	+4 13·00	− 5 51·3	8–8	12 45 44·95	9·5974$_n$	+23 8 10·3	0·8053	+0·07	−4·6	5
19	16 42 43	−3 59·56	− 3 11·3	8–8	12 54 35·76	9·5944$_n$	+22 26 49·8	0·8156	+0·06	−3·8	6
21	16 30 12	−2 5·20	− 5 33·7	9–9	13 3 17·31	9·5900$_n$	+21 44 38·3	0·8252	+0·08	−3·7	7
25	17 3 12	+4 7·98	− 1 2·4	8–7	13 20 22·38	9·5887$_n$	+20 16 38·9	0·8111	+0·13	−3·7	8
28	16 42 58	−2 33·01	+ 0 3·3	8–8	13 32 36·75	9·5847$_n$	+19 9 51·7	0·8249	+0·14	−3·2	9
Nov. 4	17 1 55	−2 35·17	− 4 40·8	4–4	13 59 54·05	9·5792$_n$	+16 31 6·2	0·8218	+0·21	−2·2	10
6	17 10 13	+2 1·47	− 3 37·7	8–8	14 7 19·54	9·5771$_n$	+15 45 48·9	0·8197	+0·24	−2·3	11
14	17 9 36	+0 7·65	+ 2 35·6	6–6	14 35 23·40	9·5709$_n$	+12 48 23·4	0·8255	+0·34	−1·6	12
15	17 25 52	+3 4·12	− 9 37·7	7–7	14 38 45·54	9·5670$_n$	+12 26 0·9	0·8206	+0·35	−1·8	13
16	17 16 58	+5 44·87	− 4 2·3	6–6	14 42 3·09	9·5684$_n$	+12 4 46·9	0·8242	+0·37	−1·9	14

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	Greenwich Mean Time.	Comet–Star. Δα.	Comet–Star. Δδ.	No. of Comps.	Comet's App. R.A.	Log (p×Δ).	Comet's App. Dec.	Log (p×Δ).	Red. to App. Place.		Comp. Star.
1887.	h m s	m s	′ ″		h m s		° ′ ″		s		
Dec. 6	17 33 49	+1 8·45	−10 12·2	9–9	15 40 57·31	9·5477$_{n}$	+ 5 37 56·6	0·8306	+0·66	−0·7	15
8	17 27 27	−0 23·41	+ 5 44·6	6–6	15 46 10·42	9·5492$_{n}$	+ 5 4 16·5	0·8324	+0·70	−0·5	16
10	17 36 4	+1 7·10	− 8 35·2	8–8	15 51 17·87	9·5429$_{n}$	+ 4 31 18·9	0·8322	+0·73	−0·6	17
13	18 7 26	+3 1·60	+ 0 49·8	5–5	15 58 49·82	9·5156$_{n}$	+ 3 43 36·3	0·8308	+0·78	−0·3	18
16	17 49 48	+1 5·47	+ 3 12·8	8–8	16 6 3·03	9·5265$_{n}$	+ 2 58 12·2	0·8340	+0·84	−0·5	19
18	18 1 47	−2 17·55	− 0 33·9	8–8	16 10 46·61	9·5132$_{n}$	+ 2 29 1·7	0·8345	+0·87	−0·3	20
27	18 0 47	+1 15·56	− 1 54·0	4–4	16 30 48·10	9·4979$_{n}$	+ 0 28 46·4	0·8400	+1·04	−0·5	21
1888. Jan. 8	17 42 45	−0 48·58	− 2 51·8	8–8	16 54 44·46	9·4922$_{n}$	− 1 45 45·5	0·8468	−1·84	+5·3	22
9	17 49 19	−4 3·28	− 8 47·7	8–8	16 56 37·24	9·4817$_{n}$	− 1 56 0·4	0·8476	−1·83	+5·0	23
Feb. 10	17 12 40	−1 26·65	− 6 53·3	4–4	17 45 47·81	9·4227$_{n}$	− 6 0 57·5	0·8633	−1·22	+1·0	24

Notes.

October 12.—Definition bad.

October 13–19.—Comet faint from haze during the earlier comparisons.

October 17–25.—Comet faint owing to the coming daylight during the later comparisons.

November 4.—The observation was obtained with difficulty between clouds, and hence is rather doubtful.

November 14.—Observation interrupted by passing clouds.

December 8.—Interrupted by clouds passing. Rather windy.

December 13.—Interrupted by clouds. Comet faint owing to the coming daylight during the later comparisons.

December 16.—Very windy; the clock heard with difficulty.

December 27.—Interrupted by clouds passing.

January 8.—Comet rather faint.

January 9.—Comet faint owing to fog and the coming dawn.

February 10.—The comet has become sensibly fainter since the last observation. Interrupted by clouds.

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Comet I. 1888 (*Sawerthal*).

1888.		Greenwich Mean Time.	Comet—Star. Δα.	Comet—Star. Δδ.	No. of Comps.	Comet's App. R.A.	Log (p × Δ).	Comet's App. Dec.	Log (p × Δ).	Red. to App. Place.		Comp. Star.
		h m s	m s	′ ″		h m s		° ′ ″		s	″	
April	3	15 56 34	−0 59·58	− 5 30·3	3–3	22 9 24·31	9·5554n	+ 5 58 46·8	0·8323	−0·99	− 7·5	25
	3	16 9 34	−5 55·23	− 2 11·3	1–1	22 9 26·38	9·5499n	+ 5 59 21·3	0·8304	−1·01	− 7·6	26
	4	15 53 24	+4 17·65	− 9 24·0	7–7	22 12 25·81	9·5570n	+ 7 0 8·7	0·8307	−0·96	− 7·7	27
	11	15 38 21	−1 0·39	− 3 6·3	9–8	22 33 4·22	9·5685n	+13 31 23·0	0·8172	−0·89	− 9·1	28
	18	15 19 29	+3 6·75	+ 4 42·5	7–7	22 52 38·17	9·5833n	+19 2 23·3	0·8054	−0·79	−10·0	29
	20	15 13 21	+0 25·07	+ 8 27·5	8–8	22 58 0·54	9·5878n	+20 27 18·4	0·8028	−0·78	−10·2	30
May	1	15 2 48	+4 6·05	− 0 12·9	6–6	23 25 49·60	9·6095n	+27 12 27·8	0·7721	−0·61	−11·3	31
	5	14 37 55	+1 50·59	− 8 57·7	7–7	23 35 8·75	9·6202n	+29 17 20·6	0·7777	−0·56	−11·6	32
	7	13 49 51	+2 45·79	− 5 36·1	8–8	23 39 35·66	9·6181n	+30 15 32·3	0·8109	−0·53	−11·7	33
	8	13 48 28	−1 45·49	− 2 15·5	8–8	23 41 49·34	9·6203n	+30 44 9·9	0·8090	−0·54	−11·7	34
	10	13 48 20	−1 19·08	− 6 57·3	9–9	23 46 10·54	9·6257n	+31 39 58·5	0·8031	−0·50	−11·8	35
	11	13 39 20	+1 26·67	− 1 30·5	8–8	23 48 19·12	9·6254n	+32 6 58·1	0·8077	−0·47	−11·8	36
	12	13 45 43	+3 10·86	− 2 57·0	9–9	23 50 26·95	9·6302n	+32 33 34·7	0·7991	−0·44	−11·9	37
	13	13 24 25	+3 50·02	+ 1 35·0	8–8	23 52 31·21	9·6251n	+32 59 41·2	0·8144	−0·42	−11·9	38
	13	13 30 52	+2 5·75	+ 8 3·8	6–6	23 52 31·52	9·6279n	+32 59 45·7	0·8089	−0·43	−11·9	39
	23	11 58 55	+4 53·92	− 7 14·1	7–7	0 11 54·69	9·5959n	+36 56 48·9	0·8566	−0·22	−12·2	40
	26	11 25 24	−0 53·64	+ 3 36·1	9–9	0 17 13·29	9·5682n	+38 0 50·5	0·8744	−0·19	−12·2	41
	27	11 33 25	−3 41·45	− 6 23·6	8–8	0 18 57·52	9·5842n	+38 21 37·0	0·8662	−0·18	−12·3	42

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1888.		Greenwich Mean Time.	Comet—Star. Δα.	Comet—Star. Δδ.	No. of Comps.	Comet's App. R.A.	Log (p×Δ).	Comet's App. Dec.	Log (p×Δ).	Red. to App. Place.		Comp Star
		h m s	m s	′ ″		h m s		° ′ ″		s	″	
May	30	11 18 45	−3 31·07	− 6 49·1	8–8	0 23 58·16	9·5797n	+39 22 12·7	0·8699	−0·11	−12·3	43
	31	11 21 13	+3 10·84	+ 2 33·8	8–8	0 25 36·01	9·5882n	+39 42 7·0	0·8658	−0·04	−12·3	44
June	3	12 47 32	+1 26·45	− 4 36·4	9–9	0 30 24·23	9·6721n	+40 40 26·9	0·7767	−0·02	−12·3	45
	6	11 8 48	−2 54·33	− 5 35·4	8–8	0 34 45·59	9·6030n	+41 34 16·1	0·8600	+0·07	−12·3	46
	13	11 34 20	−1 20·14	+ 4 43·1	8–8	0 41 34·20	9·6656n	+43 35 50·8	0·8122	+0·30	−12·1	47
July	3	12 7 28	−1 17·24	− 3 42·6	9–9	1 3 2·25	9·7397n	+48 30 10·0	0·6642	+0·99	−11·3	48
Aug.	8	11 28 15	−1 12·40	+ 1 21·7	8–8	0 59 39·80	9·7484n	+54 23 29·5	0·3180	+2·66	− 5·2	49
	10	11 12 20	−1 55·19	− 4 21·5	5–5	0 57 51·09	9·7562n	+54 34 42·8	0·3351	+2·76	− 4·7	50

Notes.

April 3.—Passing clouds. April 18.—Sky rather hazy. April 20.—Foggy, cloudy at times: comet rather faint in consequence.

May 5.—Comet rather fainter than expected (this is the first indication of variability of brightness noted).

May 12.—Sky hazy and the comet fainter in consequence.

May 23.—Sky very clear. Comet brighter than expected. This increase of brilliancy is noted by Dr. Schwarz, in Dorpat. (See *A.N.* 2842) and others.

May 27.—Comet fainter; sky hazy. May 30.—Windy; clock difficult to follow at times.

May 31–June 13.—The comparisons in R.A. are difficult and rather uncertain owing to the elongated form of the nucleus of the comet in the direction of the parallel of declination.

June 3.—Sky hazy. Observation scarcely satisfactory. June 6.—Comet faint, owing to fog.

July 3.—Comet much fainter than when last seen and difficult to observe with accuracy.

Aug. 8.—Comet very faint and the coma has almost disappeared. Nucleus small and starlike. On Aug. 2 the nucleus was indeed thought to be a small star within the coma, and no observation was then taken, as it was considered that such observation would be that of a star and would not accurately represent the place of the comet.

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Assumed Mean Places of Comparison Stars.

Comet V. 1887.

Comp. Star.	R.A. 1887·0.			Decl. 1887·0.			Authority.
	h	m	s	°	′	″	
1	9	53	5·31	+30	11	11·4	$\frac{1}{4}$ (Gr. 9 yr. 949 + Gr. 7 yr. 1221 + Yarn. 4162 + Arm.$_1$ 2180).
2	12	11	28·09	+25	15	10·5	B.W.$_2$ 193. The R.A. of Lal. 23011, which is the same star, is 1$^{\mathrm{s}}$·28 less.
3	12	23	47·78	+24	44	1·7	18 *Comæ* $\frac{1}{3}$ (2 Arm.$_1$ 2684 + Lal. 23357).
4	12	25	25·01	+24	23	44·6	$\frac{1}{2}$ (Yarn. 5217 + B.W.$_2$ 500–1).
5	12	41	31·88	+23	14	6·1	B.W.$_2$ 822.
6	12	58	35·26	+22	30	5·0	B.W.$_2$ 1124.
7	13	5	22·43	+21	50	15·8	$\frac{1}{2}$ (Arm.$_2$ 1531 + B.W.$_2$ 45–6). The declination of Arm.$_2$ 1531 is about 1′ less; that of Weisse is confirmed by Lal. 24505, the same star with an erroneous R.A.
8	13	16	14·27	+20	17	45·0	Equat. comparison with Arm.$_1$ 2838
9	13	35	9·63	+19	9	51·6	B.W.$_2$ 676–7.
10	14	2	29·01	+16	35	49·2	B.W.$_2$ 1341.
11	14	5	17·83	+15	49	29·0	$\frac{1}{2}$ (B.W.$_2$ 61 + Lal. 26005).
12	14	35	15·41	+12	45	49·4	$\frac{1}{3}$ (2 Glasg. 3625 + B.W.$_1$ 619).
13	14	35	41·07	+12	35.	40·3	$\frac{1}{3}$ (2 Glasg. 3631 + B.W.$_1$ 628).
14	14	36	17·84	+12	8	51·1	32 *Boötis* $\frac{1}{4}$ (Glasg. 3635 + Arm.$_1$ 3101 + B.W.$_1$ 638 + Lal. 26777). The proper motion of this star from a comparison of the above catalogues, and Bradley 1879 appears to be −0$^{\mathrm{s}}$·011 in R.A. and −0″·145 in decl.
15	15	39	48·19	+ 5	48	9·5	$\frac{1}{3}$ (2 Arm.$_2$ 1837 + Lal. 28716).
16	15	46	33·13	+ 4	58	32·5	$\frac{1}{2}$ (Lam. 1850 + Equat. comparison with ε *Serpentis*).
17	15	50	10·04	+ 4	39	54·7	$\frac{1}{4}$ (2 Glasg. 3919 + B.W.$_1$ 922 + Lal. 28995–6).
18	16	1	50·64	+ 3	42	46·8	$\frac{1}{3}$ (Glasg. 3968 + Arm.$_2$ 1887 + Lam. 1943). This star has possibly proper motion in declination only. None, however, is assumed.
19	16	4	56·72	+ 2	55	0·0	$\frac{1}{2}$ (Glasg. 3987 + Arm.$_2$ 1895).
20	16	13	3·29	+ 2	29	35·8	B.B. vi. + 2° 3076.
21	16	29	31·50	+ 0	30	40·9	$\frac{1}{2}$ (Lam. 5205 + Equat. comparison with Glasg. 4093).
	1888·0.			1888·0.			
22	16	55	34·88	− 1	42	59·0	$\frac{1}{4}$ (Lam. 5433 + B.W.$_1$ 1017 + Schj. 6055 + Equat. comparison with Glasg. 4217).
23	17	0	42·35	− 1	47	17·7	B.B. vi.–1° 3294.
24	17	47	15·68	− 5	54	5·3	$\frac{1}{4}$ (B.W.$_1$ 917 + Lam. 2491 + Arm.$_2$ 2119 + Cord. Zones).

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Comet I. 1888.

Comp. Star.	R.A. 1887·0.			Decl. 1887·0.			Authority.
	h	m	s	°	′	″	
25	22	10	24·88	+ 6	4	24·7	Schj. 9094.
26	22	15	22·62	+ 6	1	40·3	$\frac{1}{3}$ (2 Glasg. 5791 + B.W.$_1$ 271).
27	22	8	9·12	+ 7	9	40·4	$\frac{1}{4}$ (2 Glasg. 5741 + B.W.$_1$ 114 + Lal. 43361–2).
28	22	34	5·50	+ 13	34	38·4	$\frac{1}{2}$ (Lam. 3147 + B.W.$_1$ 688).
29	22	49	32·21	+ 18	57	50·7	$\frac{1}{3}$ (Lam. 1728 + B.W.$_2$ 1109 + Lal. 44837).
30	22	57	36·25	+ 20	19	1·1	$\frac{1}{3}$ (2 Arm.$_2$ 3116 + B.W.$_2$ 1279).
31	23	21	44·16	+ 27	12	52·0	Equat. comparison with B.W.$_2$ 296 and B.W.$_2$ 384.
32	23	33	18·73	+ 29	26	29·8	B.W.$_2$ 692.
33	23	36	50·40	+ 30	21	20·1	B.W.$_2$ 777–8.
34	23	43	35·37	+ 30	46	37·1	Equat. comparison with B.W.$_2$ 860 and B.W.$_2$ 991.
35	23	47	30·12	+ 31	47	7·6	Lal. 46809.
36	23	46	52·92	+ 32	8	40·5	A.N. 2861 (Leiden A. G. Zones 118–123).
37	23	47	16·53	+ 32	36	43·6	B.W.$_2$ 966.
38	23	48	41·61	+ 32	58	18·1	$\frac{1}{2}$ (B.W.$_2$ 989 + Lal. 46847).
39	23	50	26·20	+ 32	51	53·8	$\frac{1}{4}$ (2 Arm.$_2$ 3270 + B.W.$_2$ 1020 + Lal. 46911–2). The R.A of Bessel appears to be 1^s too great. It has been diminished accordantly.
40	0	7	0·98	+ 37	4	15·2	$\frac{1}{2}$ (Yarn. 59 + Paris Observations).
41	0	18	7·12	+ 37	57	26·6	R *Andromedæ*, B.B. vi. + 37°·58.
42	0	22	39·16	+ 38	28	12·9	$\frac{1}{2}$ (B.W.$_2$ 530 + Lal. 618).
43	0	27	29·34	+ 39	29	14·1	$\frac{1}{4}$ (2 Arm.$_2$ 81 + B.W.$_2$ 656–7 + Lal. 788–9).
44	0	22	25·21	+ 39	39	45·5	$\frac{1}{2}$ (B.W.$_2$ 524 + Lal. 606).
45	0	28	57·76	+ 40	45	15·5	$\frac{1}{2}$ (B.W.$_2$ 689 + Lal. 836).
46	0	37	39·85	+ 41	40	3·7	Equat. comparison with B.B. vi. + 41°·126.
47	0	42	54·04	+ 43	31	19·8	$\frac{1}{2}$ (B.W.$_2$ 1058 + Lal. 1303).
48	1	4	18·50	+ 48	34	3·9	$\frac{1}{2}$ (Radc.$_1$ 356 + Arg. Oe.$_1$ 1181).
49	1	0	49·54	+ 54	22	12·9	μ *Cassiopeiæ* $\frac{1}{3}$ (Gr. 9 yr. 103 + Yarn. 565 + Radc.$_1$ 329).
50	0	59	43·52	+ 54	39	9·1	Equat. comparison with θ *Cassiopeiæ* and Radc.$_1$ 334.

Col. Tomline's Observatory, Orwell Park:
1888, *November* 23.

Observations of Comets a 1888 (Sawerthal), and e 1888 (Barnard), made at the Royal Observatory, Greenwich.

(*Communicated by the Astronomer Royal.*)

The observations were made with the East or Sheepshanks equatorial, aperture 6·7 inches, by taking transits over two cross wires at right angles to each other, and each inclined 45° to the parallel of declination.

Comet a 1888 (*Sawerthal*).

Greenwich Mean Solar Time.	Observer.	☄−✱ R.A.	Corr. for		☄−✱ N.P.D.	Corr. for		No. of Comp.	Apparent R.A.	Apparent N.P.D.	Comp. Star
			Par.	Refraction		Par.	Refraction				
1888. d h m s		m s	s	s	′ ″	″	″		h m s	° ′ ″	
June 8 10 59 11	T.	−0 17·12	−0·20	0·00	− 3 6·3	−3·8	−0·5	8	...	...	*a*
11 5 42	...	+1 33·75	−0·20	0·00	+ 4 34·9	−3·7	+0·8	2	...	...	*b*
11 7 43	...	+1 31·50	−0·20	0·00	+ 2 52·2	−3·7	+0·5	1	0 37 34·50	47 49 44·1	*c*
9 11 13 12	H.	−4 15·68	−0·20	0·00	− 4 38·2	−3·6	−0·6	4	0 38 57·03	47 32 29·3	*d*
11 11 36 41	T.	−0 31·50	−0·20	0·00	+ 2 11·5	−3·4	+0·2	2	...	...	*e*
28 11 15 53	A. D.	+0 11·17	−0·20	0·00	−12 1·3	−2·9	−0·6	3	0 59 24·77	42 37 16·9	*f*
11 27 19	...	−1 22·56	−0·22	0·00	+ 4 40·7	−2·8	+0·2	5	0 59 31·62	42 37 29·4	*g*
July 10 12 12 16	H.	+0 16·55	−0·30	0·00	− 2 0·2	−2·5	−0·1	2	1 6 10·45	40 2 32·2	*h*
12 24 51	...	−0 20·80	−0·30	0·00	+ 1 14·8	−2·5	0·0	1	...	...	*i*

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